

Name:

Mr. Davis

Solutions

1. Simplify $(4 + \sqrt{3})(4 - \sqrt{3})$

$$16 - 4\sqrt{3} + 4\sqrt{3} - \sqrt{9}$$

$$16 - 3$$

$$13$$

2. Simplify $3\sqrt{8} + 4\sqrt{18} - 2\sqrt{32}$

$$3\sqrt{4 \cdot 2} + 4\sqrt{9 \cdot 2} - 2\sqrt{16 \cdot 2}$$

$$3 \cdot 2\sqrt{2} + 4 \cdot 3\sqrt{2} - 2 \cdot 4\sqrt{2}$$

$$6\sqrt{2} + 12\sqrt{2} - 8\sqrt{2} = 10\sqrt{2}$$

3. Solve $\sqrt{x-11} = 5$

$$(\sqrt{x-11})^2 = (5)^2$$

$$\sqrt{25} = 5$$

$$x-11 = 25$$

$$x-11 = 25$$

$$x = 36$$

$$x = 36$$

4. Solve $(3x+1)^{\frac{1}{3}} = 4$

$$\sqrt[3]{3x+1} = 4$$

$$\sqrt[3]{64} = 4$$

$$3x+1 = 64$$

$$3x = 63$$

$$x = 21$$

$$x = 21$$

5. Find 15% of 140. You must show work to receive full credit.

$$10\% \text{ of } 140 \text{ is } 14$$

$$5\% \text{ of } 140 \text{ is } 7$$

$$15\% \text{ of } 140 \text{ is } 14 + 7 = 21$$

6. Find 130% of 50. You must show work to receive full credit.

$$130\% \text{ of } 50 \text{ is equal to } 50\% \text{ of } 130 \text{ or } 65$$

7. The rabbit population on Bunny Island is 6,710 today. If the population over the next year increases by 27.5%, then what will be the size of the population in one year? You must show work to receive full credit.

$$27.5\% \text{ of } 6710 = (.275)(6710) = 1845.25$$

$$6710 + 1845 = 8,555 \text{ rabbits}$$

8. A certain strain of bacteria that is growing on your kitchen counter doubles every 6 minutes. Assuming there are 10 bacteria when you first notice the bacteria present, determine the number of bacteria that will likely be present at the end of an hour and 48 minutes. You must show work to receive full credit.

$$f(x) = 10(2)^x$$

$$f(18) = 10(2)^{18}$$

$$= 2,621,440$$

1 hour and 48 minutes = 108 min

$$\frac{108}{6} = 18$$

There are 18 6-minute periods

9. An exponential function contains the two points (2,12) & (3,72). Determine an equation for this function. Determine the y-value when $x = 4$.

x	0	1	2	3
y	$\frac{1}{3}$	2	12	72

$$b = 6 \quad f(x) = \frac{1}{3}(6)^x$$

$$a = \frac{1}{3} \quad f(4) = \frac{1}{3}(6)^4 = 432$$

10. An exponential function contains the two points (0,2) & $(3, \frac{1}{32})$. Determine an equation for this function. Determine the y-value when $x = -1$.

x	0	1	2	3
y	2	$\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{32}$

$$a = 2 \quad f(x) = 2\left(\frac{1}{4}\right)^x$$

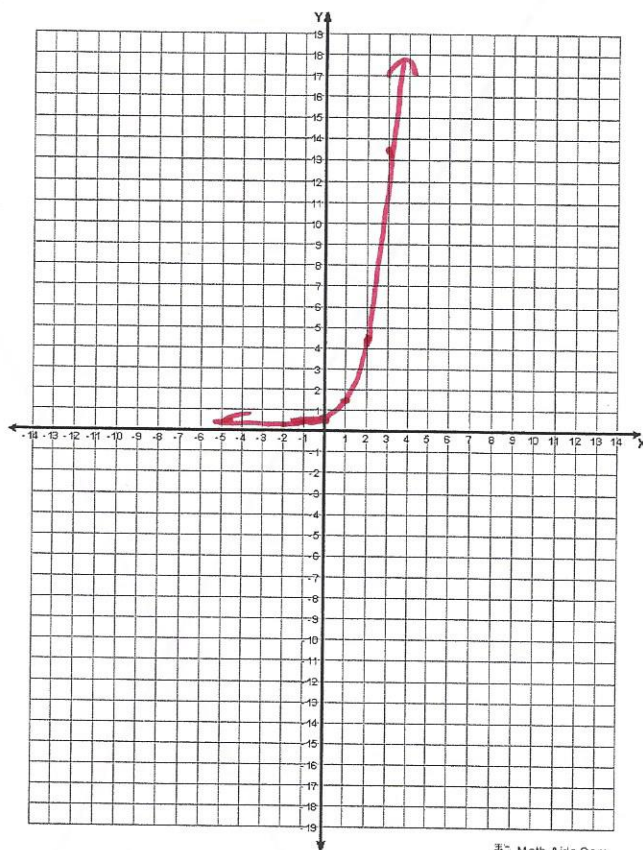
$$b = \frac{1}{4} \quad f(-1) = 2\left(\frac{1}{4}\right)^{-1} = 2 \cdot 4 = 8$$

11. Circle all the functions that represent exponential decay:

a. $f(x) = \frac{1}{2}(0.99)^x$ b. $f(x) = 7\left(\frac{8}{9}\right)^x$ c. $f(x) = 18\left(\frac{4}{5}\right)^{-x}$ d. $f(x) = 0.8(4)^x$

12. Given the exponential function $f(x) = \frac{1}{2}(3)^x$, fill in the x-y table, plot the points carefully and draw the GRAPH neatly.

X	Y
-2	$\frac{1}{18}, \frac{1}{6}$
-1	$\frac{1}{2}, \frac{3}{2}$
0	$\frac{1}{2}, \frac{3}{2}$
1	$\frac{3}{2}, \frac{27}{2}$
2	
3	



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13. Given the parent function $f(x) = (2)^x$, function $g(x)$ results from a transformation of function $f(x) = (2)^x$. What is an equation of $g(x)$?

